



# **SPELLBINDING POSSIBILITIES**



## **NATURAL**

---

**The Development Platform for Electronic Business**

# Experience the magic of Natural

## FASCINATING PROSPECTS

The Internet revolution has transformed the global economy at a breathtaking pace, creating the fastest rates of economic growth in history. E-business is now of vital strategic importance to companies of all sizes and in all industries. And the changes go much deeper than Internet shopping and other front-end e-commerce systems: The latest technologies enable companies to streamline processes of all kinds, realizing cost savings, improving customer relationships, and developing and implementing new business models. Your company's ability to exploit the Internet will have a huge impact on your future. To secure a genuine competitive edge, you need applications that provide unique ways of addressing these challenges, and that power up your proven business model for the e-business age.

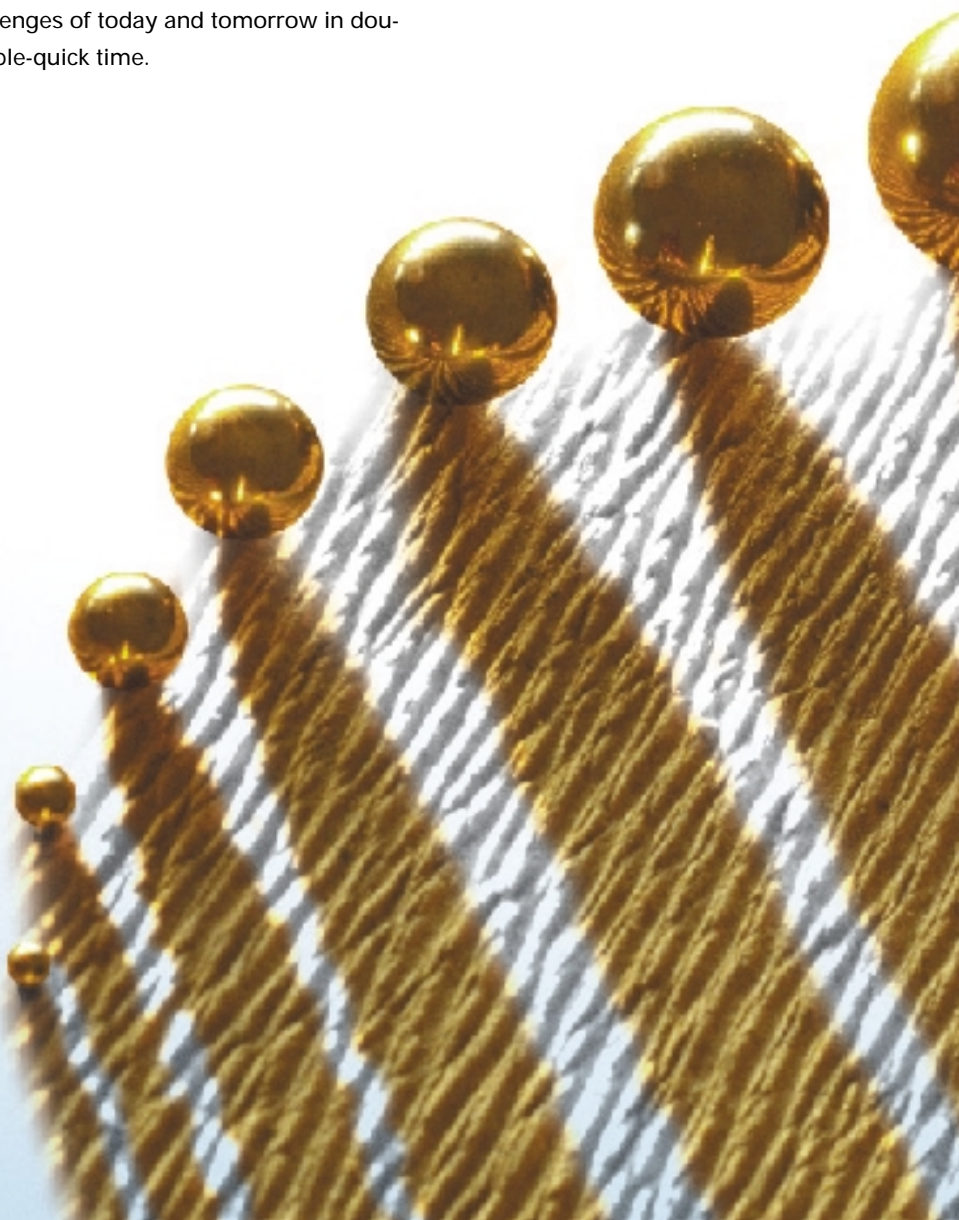
## SQUARING THE CIRCLE

Major challenges lie ahead for your IT managers, created by the general transformation of the global economy, strategic partnerships, mergers and acquisitions, and ever shorter IT innovation cycles. Against this background, your software applications must be capable of delivering a great deal: They must support open standards and distributed computing, they must be highly scalable, and integrate easily with ERP and legacy systems. They should provide end-to-end support of your business processes, and support rapid development in order to reduce time-to-market. Impossible? Thousands of Natural users in leading companies around the globe have discovered that Natural makes the seemingly impossible an everyday reality.

## THE SECRET OF NATURAL'S SUCCESS

Natural, Software AG's development environment, is one of the world's most powerful 4GL programming languages. It was designed specifically for building mission-critical applications. For more than 20 years, Natural has been synonymous with future-proof, robust, state-of-the-art applications that combine flexibility with performance and scalability. The three-tier architecture (front-end, business logic, data storage) of this component-based environment guarantees outstanding flexibility. It allows you to create solutions tailor-made to the business challenges of today and tomorrow in double-quick time.

Reusable components mean rapid development of new applications and rapid modification in response to new business needs. Natural software can be XML- and Web-enabled with ease and speed using the Natural Web Interface, the XML Toolkit, and other powerful features. Business functionality in legacy systems can be converted to Natural components – which you can use and reuse in new applications and on new platforms.



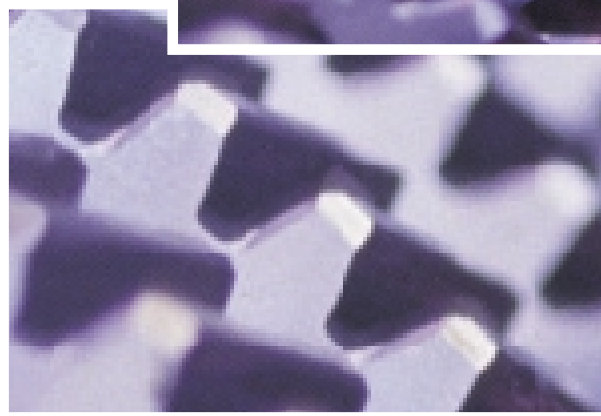
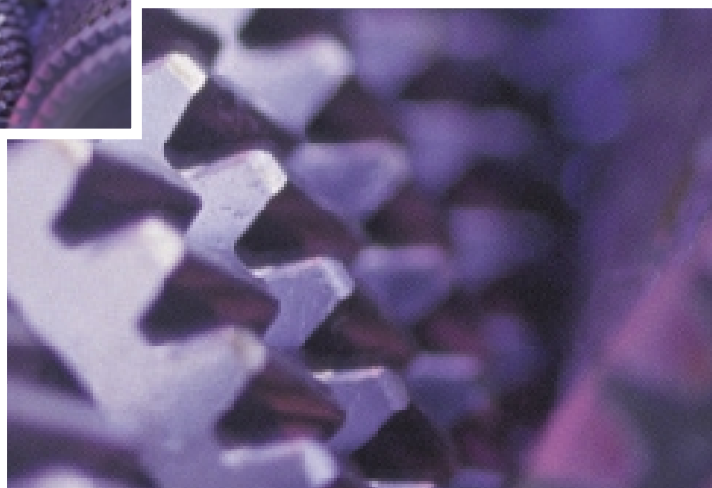


Natural syntax is logical, easy to understand and easy to learn – mimicking the structure of natural languages. Natural Studio is a remarkably user-friendly interface. Innovative Rapid Application Development (RAD) features enable your developers to automate many aspects of programming. All in all, Natural slashes the time and cost of programming, testing and maintaining your applications.

Natural-built applications are ideal for cross-platform, cross-enterprise and even inter-enterprise environments. Natural applications support all leading platforms (including mainframes, Windows, Unix and many others) and can be integrated seamlessly with all the major database systems (Adabas, Tamino, DB2, Oracle, etc.).

This brochure reveals the secrets of Natural's success and explains in detail how this unique tool can enhance your company's prospects.







# Natural gave the IT world platform-independence long before Java®

## **SUPPORT FOR ALL MAJOR PLATFORMS**

Natural is available on all the most popular enterprise platforms (OS/390, Open VMS, AS/400, Unix, Windows NT, etc.). Natural source code can be moved easily between diverse platforms and can be executed on any of them. This means that you can choose the server technology that best suits you and your IT needs, without having to modify your applications.

## **SUPPORT FOR ALL THE MAJOR DATABASES**

Natural supports all the major database systems, from Software AG's own high-pedigree product, Adabas and Tamino (the world's very first native XML database) to Oracle, DB2, IMS and VSAM – plus many, many more.

Natural's flexible SQL support allows you to access any SQL database. This means you can respond quickly when a new version of your database is introduced.

## **REUSABLE COMPONENTS**

Because they are built from components, Natural applications and modules can be deployed and used on practically any hardware platform, operating system or site. Components can be modified and exchanged, combined and re-combined with ease and speed. You can use them to model and encapsulate entire business processes. Moreover, components are highly interactive and can be employed in a wide variety of scenarios and applications. In other words, component-based programming streamlines and accelerates application development and deployment.

## **INTEROPERABILITY PAR EXCELLENCE**

Natural applications offer full interoperability with programs in other languages, such as C, Java, VisualBasic or COBOL. Modules developed in these languages can be embedded directly into Natural applications. And best of all: Thanks to defined interfaces, your programmers can make use of these functions without having to master other languages. In addition, you can use the NaturalX module to generate DCOM components which can be deployed on all DCOM-supported platforms.

## **UNBEATABLE INTEGRATION**

On Windows platforms, Natural employs the built-in DCOM functionality. On other platforms, Software AG's tried-and-trusted middleware EntireX provides the DCOM services required. EntireX forms a reliable, robust communications infrastructure that ensures integration across diverse systems, networks and platforms. EntireX can combine them all: DCOM objects, RPC, APPC, ERP systems such as SAP R/3 or R/2, transaction monitors such as IMS, CICS or MQ. Practically any application system, no matter on what system platform, can be linked seamlessly with other systems or with the Web. Even the deployment of DCOM components on mainframes is no problem for EntireX.

# High-speed technology for high-speed business

## **RAD FOR COMPETITIVE EDGE**

Programming robust, high-performance applications for mission-critical tasks is generally a time-consuming process – time which you just don't have in today's high-speed, global economy. You don't just need to be better than the others, you also have to be faster and more efficient. Natural provides full support for the Rapid Application Development (RAD) model, allowing you to build mission-critical software at high speed. A highly intuitive user interface and a variety of innovative programming features get things moving even faster. This means your Natural applications will be up and running quicker, a major advantage – particularly when it comes to entering the e-business age.

## **NATURAL CONSTRUCT – THE HIGH-POWER GENERATOR**

Natural Construct is an extremely powerful, user-friendly application generator which automates many aspects of Natural software production. Natural Construct provides a variety of reusable application structure templates, helping you to create end-to-end process chains rapidly and reliably. Once a program structure has been created with the help of Construct, the programmer only needs to

add the required parameters. What's more, templates are not strait-jackets, but can easily be tailored to the needs of your enterprise. This highly efficient approach also ensures high-quality code, since there is far less risk of input errors. And because Construct does not call for the mastery of a complicated, cryptic meta language, both IT experts and non-IT experts can create complete, high-performance applications.



#### **INTERACTIVE WEB-ENABLED SOFTWARE**

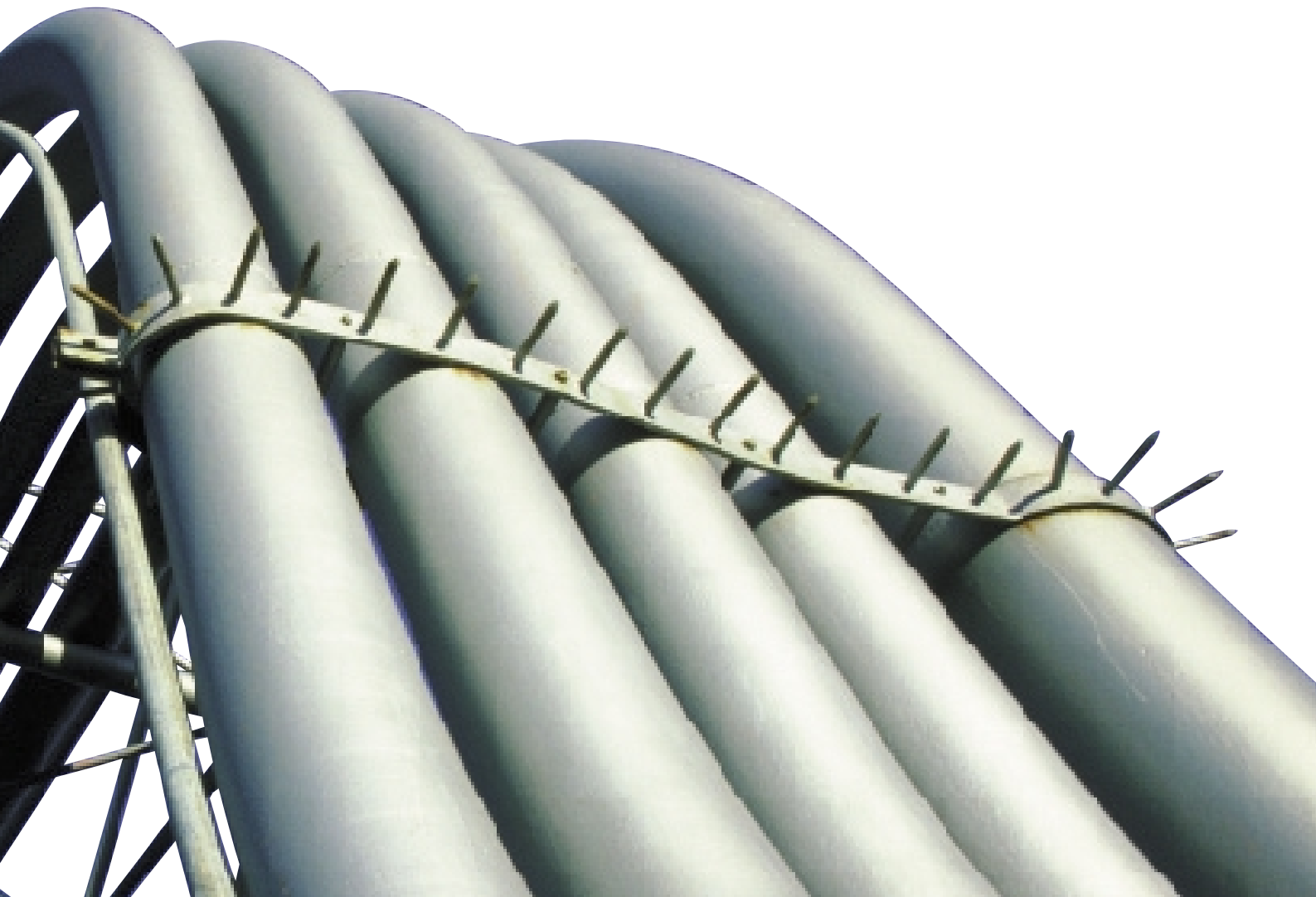
Natural Web Interface enables you to put your Natural applications on the Internet – with full functionality but only minimum modification work. The intuitive, easy to understand Natural Web Interface creates a strong, flexible link between your Natural environment and your Web server. When users call up functions from a browser, these calls are directed to a Natural sub-routine which processes the call and inserts the result in a dynamically generated Web page which is then returned to the browser. Client functionality can be tailored to the environment as required: For instance, for general use on the Internet, you can

stick to HTML only, while for use within a secure intranet, you can also implement Java applets or ActiveX controls.

#### **PUBLISHING NATURAL BUSINESS LOGIC AS WEB SERVICES**

With the Natural Wrapper, potentially all business logic implemented with Natural can be published on the Web as Web Services. A Web service is a self-contained, self-describing business component that can be dynamically published, discovered, and executed across the Web. Web Services typically communicate using XML. In effect, the Natural Wrapper generates XML-based request/response interfaces for Natural procedures.

Web Services platforms are built exclusively on open, vendor-independent standards and technologies such as the XML-based messaging convention Simple Object Access Protocol (SOAP), the Web Service Description Language (WSDL), and Universal Description, Discovery and Integration (UDDI). Web Services created with the Natural Wrapper can employ SOAP for service request and response. And naturally, WSDL-compliant descriptions of the services can be published in a UDDI registry, enabling potential users to discover them.



# Maximum security

## KEEP YOUR SECRETS UNDER WRAPS

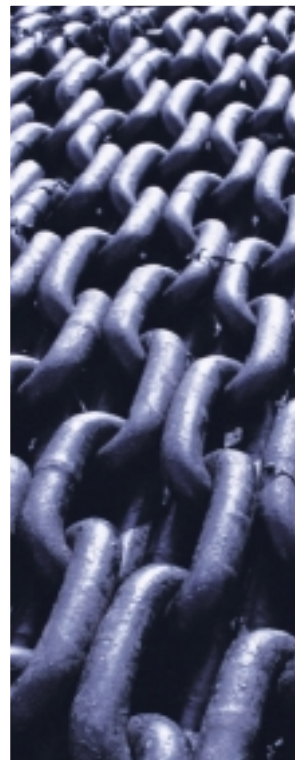
In the e-business world of open systems and Web-based communication, data integrity and security are vital. Natural offers you a comprehensive security concept, which protects development environments and production systems effectively against both internal and external threats. According to an IDC study conducted in 1999, some 90 percent of all IT security breaches are attributable to internal sources, ranging from disgruntled employees to operator errors and poorly defined access privileges. In fact, only ten percent of all instances of unauthorized access are the result of deliberate attacks by hackers or weaknesses in the security of data transferred over the Internet.

Generally, filling security gaps means time-consuming analysis and the laborious development and deployment of a variety of protective measures. And that means a serious blow to your project budget and your project time schedule. For this reason, an effective security concept that prevents unauthorized access is essential.

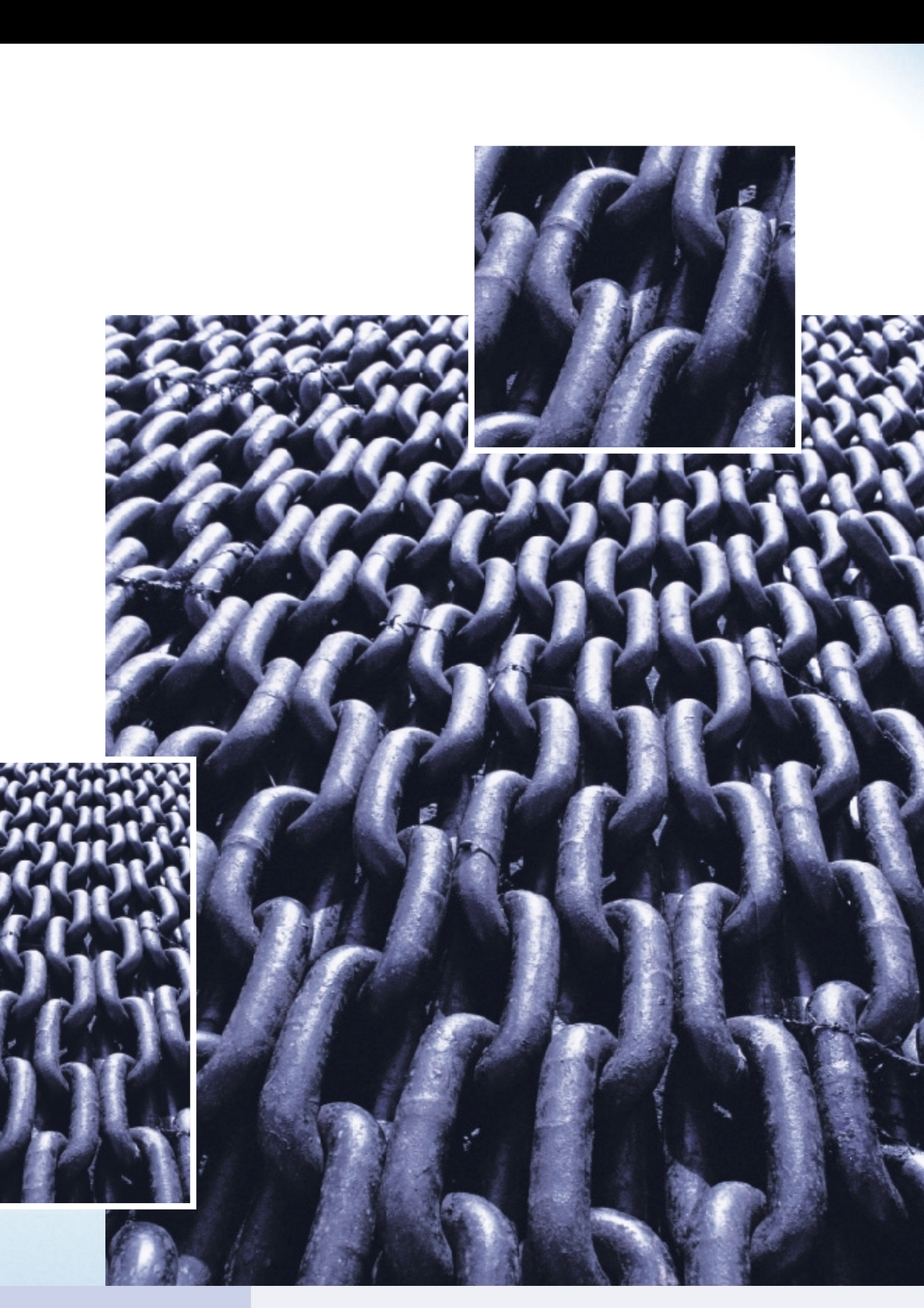
## PERFECTLY SECURE

Natural Security monitors and controls all and any access to your Natural system. You can define privileges for individuals or for groups. You can apply access privileges for entire Natural programs, for particular modules or even selected objects in accordance with a variety of freely definable criteria. In other words, you can create a tailor-made security profile for your system that defines precisely what each and every user or group of users is, or is not, allowed to do. The instant a user logs on to your system, his or her individual security profile is automatically loaded and activated. Should Natural Security register a security breach during the log-on procedure, access to the application is immediately denied and the breach automatically recorded.

Natural Security supports all leading platforms: mainframe, OpenVMS, AS/400, Unix, Windows.







# Maintain and enhance the value and quality of your applications

## A PRODUCT THAT HAS MOVED WITH THE TIMES

We have been developing and refining Natural for decades – and we're still going strong. By consistently incorporating new technologies (such as DCOM support for non-Windows platforms via NaturalX), we have ensured that Natural applications are always state of the art. The flexibility, robustness and durability of Natural applications owe much to the integrated mechanisms that automate quality control tasks. Constant checks, process standardization, and comprehensive documentation are becoming more and more important in the development of new applications. Many companies have recognized that these measures significantly improve quality and drastically reduce the error rate. Optimum quality control reduces maintenance overheads, saves a considerable amount of time, and makes less heavy demands on your production budget. This benefits you, your developers and your customers.

## QUALITY ASSURANCE – A GIVEN

Predict and Predict Application Control are two powerful Natural tools that allow you to perform automatic quality control during the development process. Predict is a data dictionary offering a broad spectrum of useful services for database design, administration and documentation. In addition, its active references give the developer a comprehensive and up-to-date overview of the application's structure – extremely useful when developing sophisticated, business-critical applications. Predict Application Control (PAC) is a version management tool that monitors all stages of software development. PAC gives the developer complete control over versions, objects, the current status of objects, etc. Its integrated repair function means you can quickly revert to the last fully functional state, if the need arises. This effectively protects your Natural code from inadvertent or inexperienced modification. In addition, PAC archives the Natural code for reference and documentation purposes. By significantly reducing maintenance requirements, it enables you to spend more time on other tasks, such as developing high-quality business applications.

## PROTECTING YOUR INVESTMENT

To protect and increase the value of existing installations, they need to be integrated into state-of-the-art systems environments. Natural protects your investments because systems written in Natural are simple to expand and integrate, ensuring longevity. Add-ons such as the Natural Web Interface let you Web-enable both new and legacy applications quickly and easily, with a minimum of modifications. As a result, you can deploy Natural applications beyond the traditional boundaries of your enterprise.

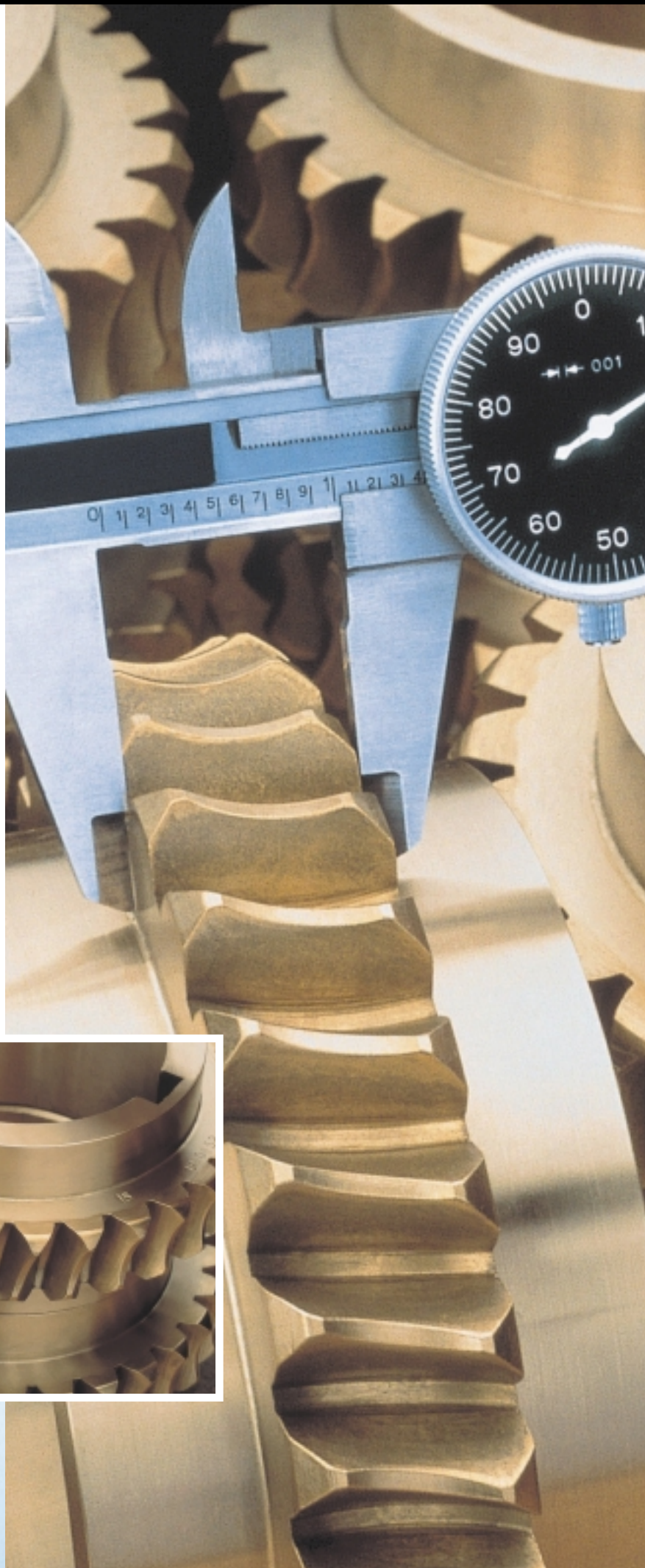
With the help of the unique Natural Engineer—a multifunctional tool for maintaining, documenting, improving and migrating Natural code – you can re-engineer Natural applications for deployment on the Internet. Existing business functions are encapsulated, producing objects that can be used immediately in Web-based applications. Natural Engineer also offers further powerful options such as code optimization and standardization, performance analysis, and code certification.

To enhance the quality of testing, Natural Engineer includes two integrated tools for test automation, quality assurance, and the provision of comprehensive test data: GenTest and GenAda. GenTest automatically checks that an application works correctly following modification. GenAda is used to create comprehensive test databases for efficient and cost-effective quality control based on representative production data. In addition, GenAda simplifies the conversion of data for new test environments.

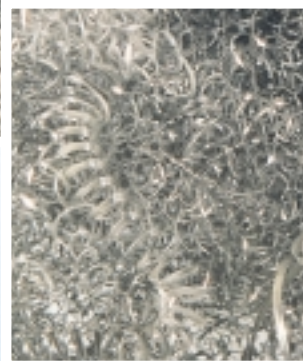
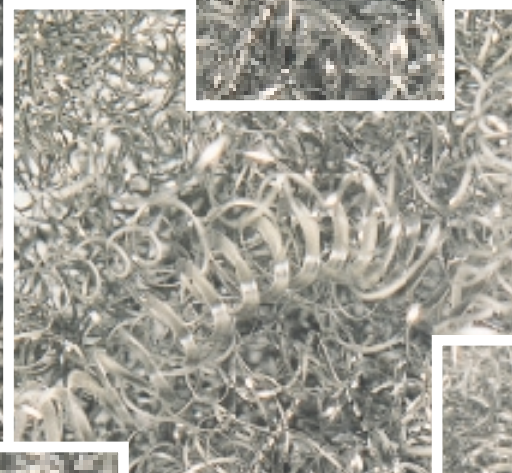
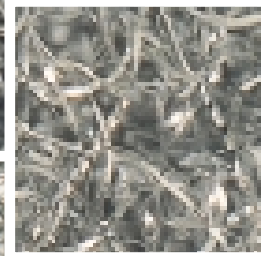
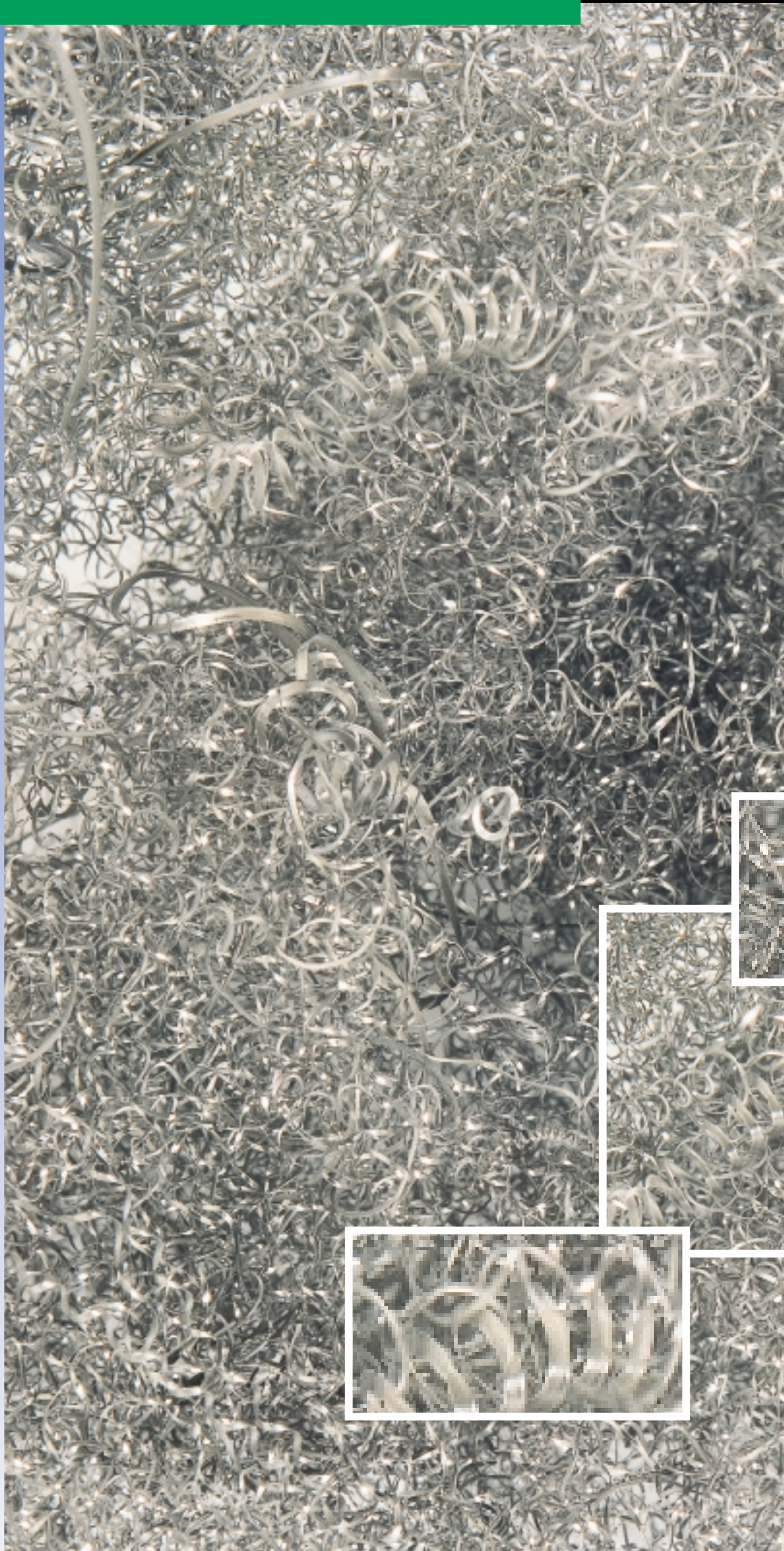


## Past, present and future

Natural has had a deservedly excellent reputation for more than 20 years. Reliable and robust, it significantly enhances development productivity for business-critical applications. Just like the acts of truly great magicians, which are polished until their perfect, effortless execution makes the audience gasp in amazement, the Natural development environment has been continuously refined and improved. Thousands of major enterprises and organizations leverage its outstanding qualities every day. And you can be sure that all future developments of Natural will be characterized by Software AG's uncompromising commitment to quality.









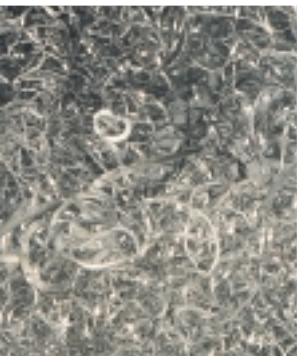
# Application development made easy

## **SIMPLE TO LEARN AND SIMPLE TO USE**

With a syntax that resembles natural languages, Natural is easy to learn and to use, so you get results quickly and with minimum effort. Natural is a fourth-generation language that supports procedural and non-procedural programming as well as object-based and event-driven code. The Natural Studio is a well-designed and user-friendly graphical development environment which the least experienced programmers will find their way around with ease.

## **POWERFUL DEVELOPMENT TOOLS**

Natural Studio comes with a wide range of tools that give you effective support in handling the most demanding tasks. From the main screen, you have easy access to all the tools, components and objects you need, which enables you to work productively and efficiently. The Navigator lets you manage object libraries by means of a tree structure like that of Microsoft Explorer.



The Program Editor is used to process Natural programs, sub-programs, sub-routines, copycode and text. Syntax highlighting in various colors enhances clarity.

With the DDM Editor, you can define database tables (Data Definition Modules), and the Data Editor is used to define data areas for local, global, parameter and object data. Once defined, data areas can be reused in multiple program objects.

The Map Editor is a convenient tool for designing screens. The screens comprise text constants, input and display fields, and various GUI elements such as menus and controls. You can also create attractive GUIs with third-party tools that can be integrated easily.

A powerful, user-friendly debugger rounds out the toolset.

## **EVENT-DRIVEN PROGRAMMING WITHOUT THE PITFALLS**

Event-driven applications are more convenient and give the end user more options. However, programming GUI applications is much more difficult than conventional screen-based applications. Natural simplifies this task. You can create dialog components visually with the help of the Natural Dialog Editor. It allows you to directly embed business logic (in the form of Natural commands, sub-programs and sub-routines) into dialog components. Each individual part can be reused and moved about between various dialog components. User dialogs can even be generated dynamically at runtime.

## **COMPLEMENTING SERVER POWER WITH DESKTOP PRODUCTIVITY**

Microsoft Windows is the de-facto standard platform for software development. Most developers prefer it to mainframes because of its graphical interface and productivity-enhancing features such as copy and paste. And naturally, companies that deploy a state-of-the-art application development environment will find it easier to attract and retain skilled personnel.

Thanks to Natural's convenient Single Point of Development scenario, software engineers can develop Natural applications for any platform without leaving Windows.

A Natural Development Server Plug-In connects the developer's desktop to a Natural development server residing on a different platform. Source code is edited in the Natural Studio and transparently retrieved from and saved in the target environment. Compilation is initiated from the Natural Studio by transparently submitting commands to the target environment. Likewise, debugging is controlled from the Natural Studio, with the application executed in the target environment.

## **INSTANT SWITCHING BETWEEN PLATFORMS**

A single common format for generated code and a single virtual machine (Natural runtime system) is now used on all open systems platforms. Natural code generated for Windows, Unix or OpenVMS can be processed on any of the others without re-compilation. This is especially beneficial for distributed applications spanning multiple hardware and operating system platforms. For performance reasons, there is a second code format and virtual machine for all mainframe platforms.

# Seamless integration into multi-platform environments

## A FLEXIBLE COMPONENT MODEL

Natural offers a whole range of standard interfaces and database connectors that make it easy to integrate your Natural programs into multi-platform IT environments.

NaturalX – now a standard part of Natural – allows you to develop and use components within Natural. The language-independent components feature plug-and-play functionality and give you a wider range of options than ever before. You can easily replace and reuse components, and they can be deployed in a variety of applications on various platforms. And because Natural components are based on Microsoft's language-neutral DCOM component model (the de facto standard), they can be accessed by programs created using other development environments – such as Bolero, VisualBasic, C++ or COBOL. Conversely, Natural clients can call up DCOM components written in other languages.

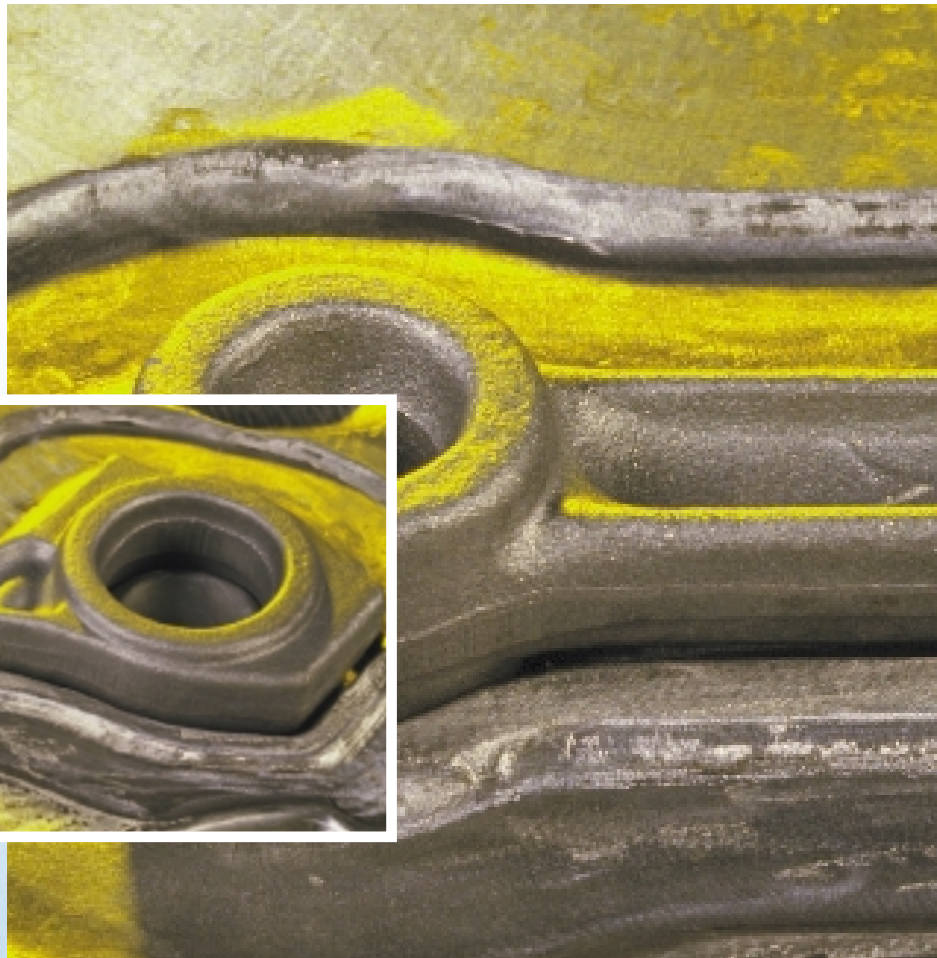
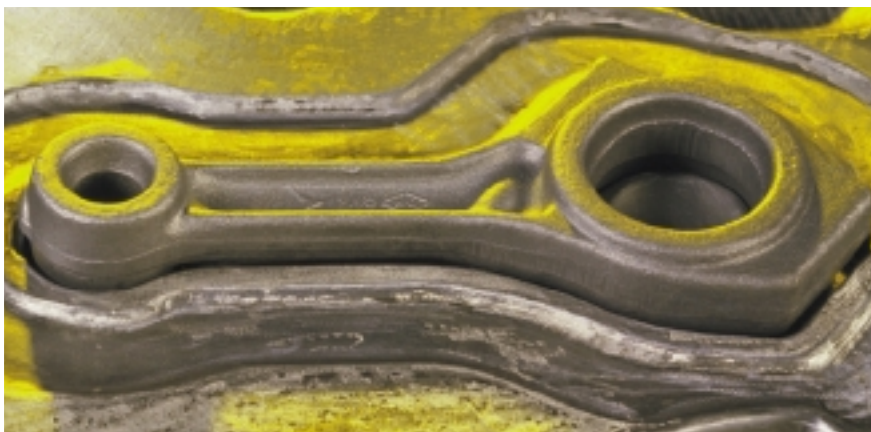
## HASSLE-FREE DEFINITION OF INTERFACES

The Class Builder supports the definition of NaturalX and DCOM component classes. Methods and properties can be specified without writing a single line of code. Classes and interfaces can be registered for access by local or remote clients, or as DCOM classes and interfaces.

The component browser lets you scan the DCOM library for interfaces, ActiveX controls or automation objects. It automatically generates copy-code so developers do not waste time entering class and interface IDs.

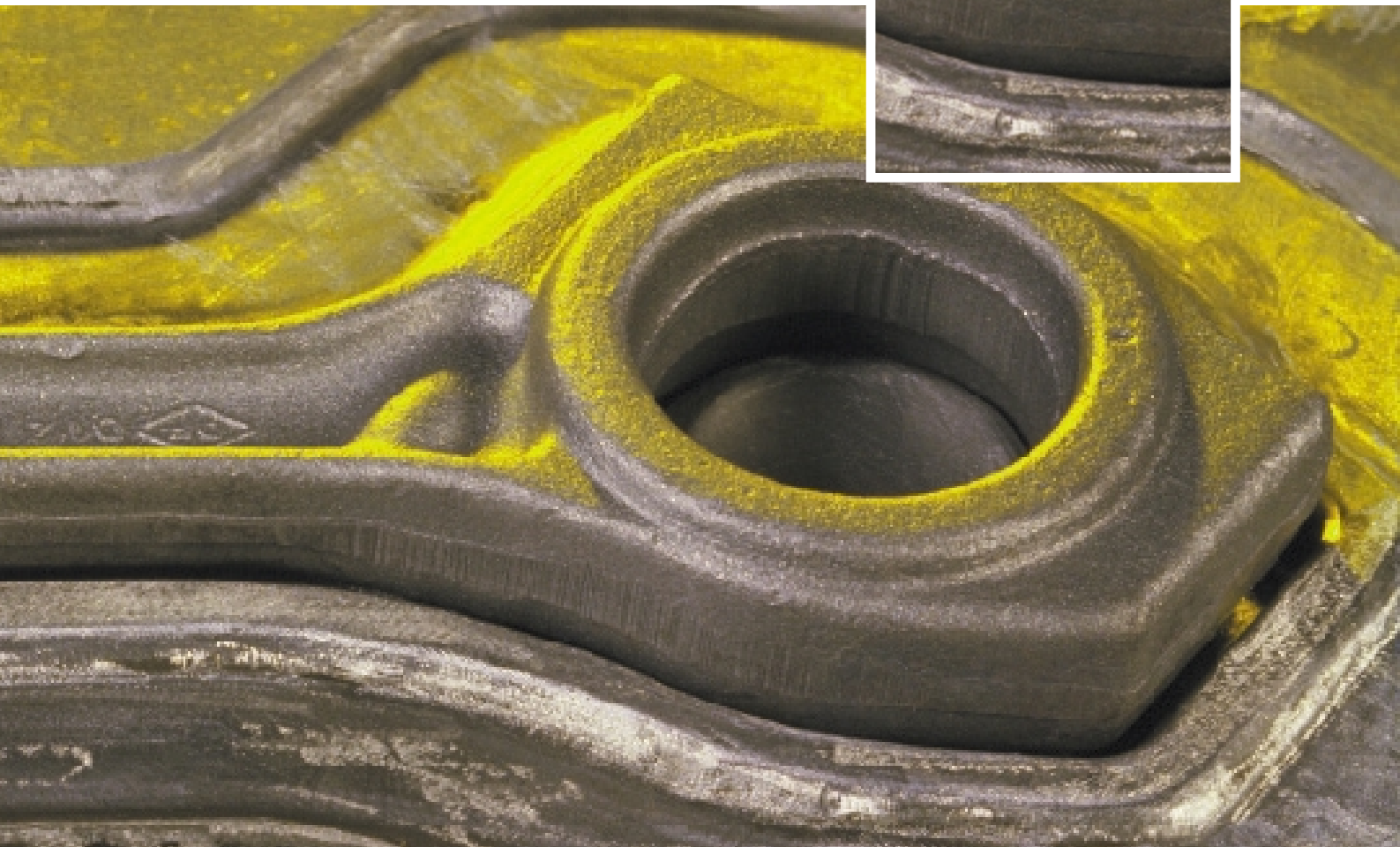
## SUPPORT FOR ALL LEADING ERP AND DATABASE SYSTEMS

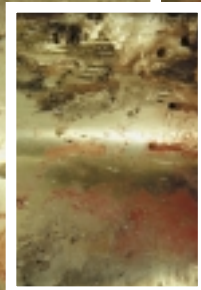
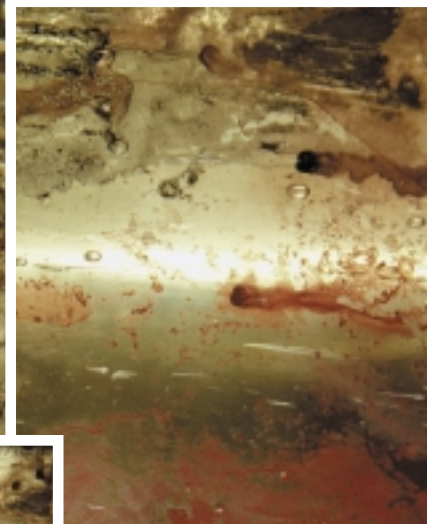
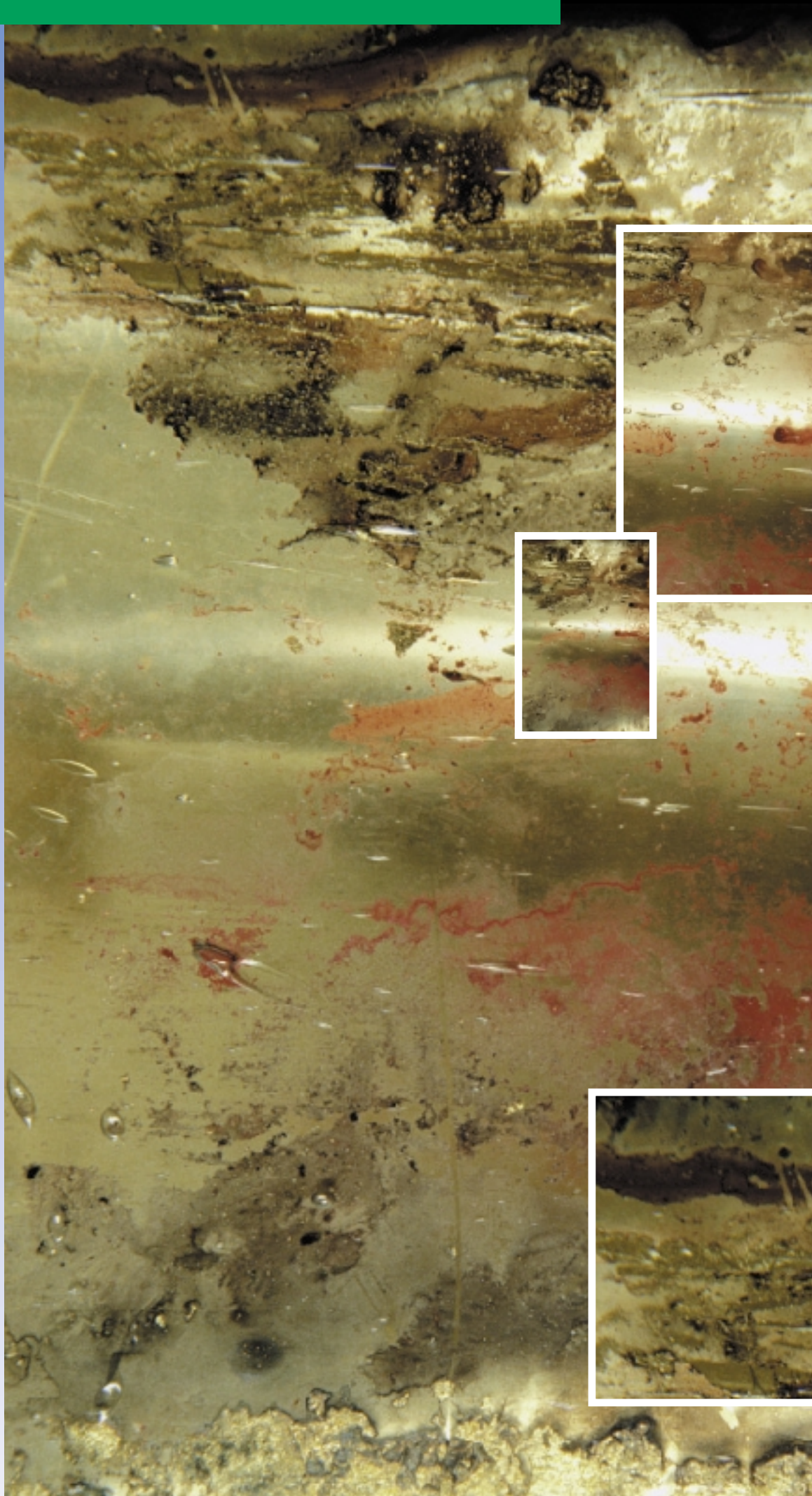
Natural offers you integrated, command-level database support. With connectors for most relational DBMSs (like DB2, Oracle, MS SQL Server), VSAM and DL/I, you can rapidly implement connectivity to these databases by incorporating appropriate database-specific commands in your Natural programs.





Integration with ERP systems from SAP or Baan is equally simple. For example, to call up R/3 functionality from within a Natural application, the programmer generates a DCOM component that encapsulates the respective SAP business logic. Once the component has been created and installed, it is available via Natural's component browser and can be used like any other DCOM component.







# Innovative features for the business applications of the future

## **DYNAMIC WEB PAGES WITH NATURAL**

The Natural Web Interface is an add-on for Internet-enabling Natural-based business applications with very little modification. Since dynamic Natural Web pages are generated at the server end, they are also ideal for thin-client solutions. When a browser calls up a URL that identifies a specific Natural subprogram, the call is sent via a CGI script to the Natural Web Server Extensions, which convert the URL either to an RPC or to a DCOM method. These then call the Natural subprogram. On execution, the subprogram generates an HTML or XML page and sends it back to the browser. Content might be obtained from an Adabas database, for example. For convenience, any HTML editor can be used to design Web pages visually. The finished page templates are then converted into Natural subprograms. Natural commands are embedded between standard HTML tags (<Natural> ... </Natural>), allowing the Web pages to contain dynamic content. During conversion, these commands become part of the generated subprogram.

## **WEB APPLICATIONS COME NATURALLY**

A statement for submitting HTTP requests has been incorporated into the Natural programming language. This gives Natural applications potential access to any resource on the Internet – including XML documents – and enables them to reach any communication partner that uses the HTTP protocol. XML data can also be retrieved from a Tamino XML Server using this statement.

The XML metalanguage is now an established and universally accepted standard in the Internet community. XML documents will soon be used for all kinds of purposes. Naturally, Software AG supplies the means for organizations deploying Natural to take full advantage of this promising and highly flexible standard.

The XML Toolkit provides Natural with the capabilities needed to process XML documents. This means that Natural applications can take part in Web-based communication and collaboration. A Natural data definition can be generated from an XML Document Type Definition, and vice versa. The content of a Natural variable can be serialized into an XML document. And an XML document can be parsed into a Natural variable.

The XML Toolkit can also be used to supply Web clients based on the eXtensible Style Sheet Language (XSL) with XML-wrapped data. A Natural application generates an XML document containing data to be presented to a Web user via browser. The XML document references an appropriate style sheet, written in standard XSL, which specifies how the XML document is to be presented in HTML format, for example. A standard style sheet processor applies the style sheet to the XML document. The beauty of this approach is that it completely separates business from presentation logic, providing a very natural route to the Web.



## All our skills at your service

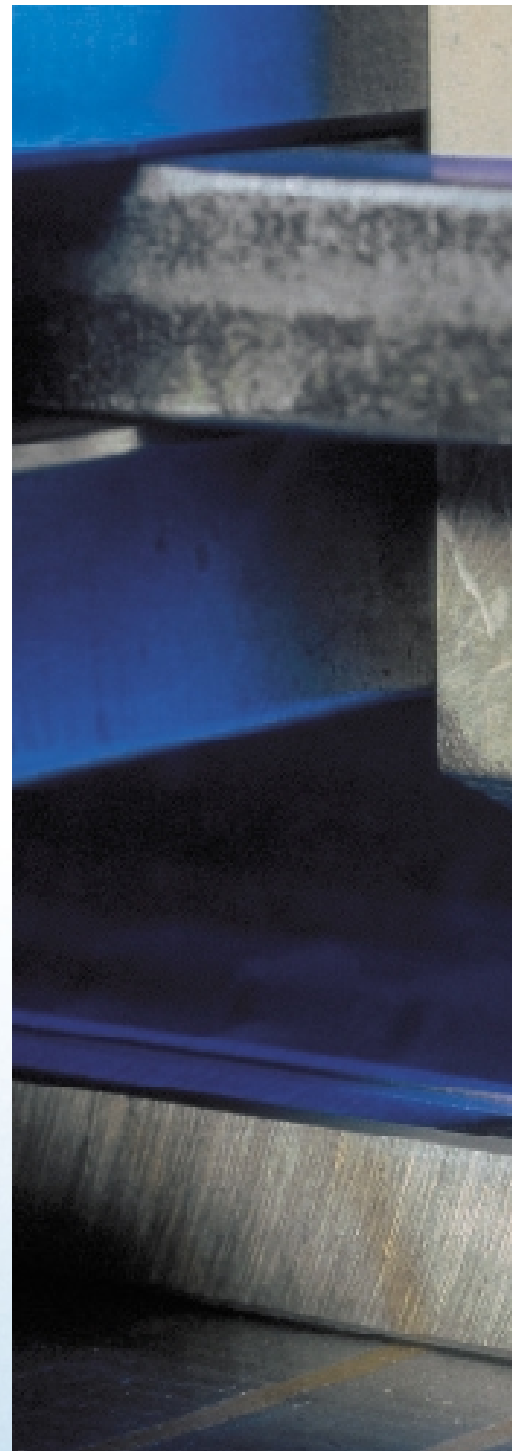
### EXCLUSIVE SUPPORT FOR YOUR DEVELOPERS

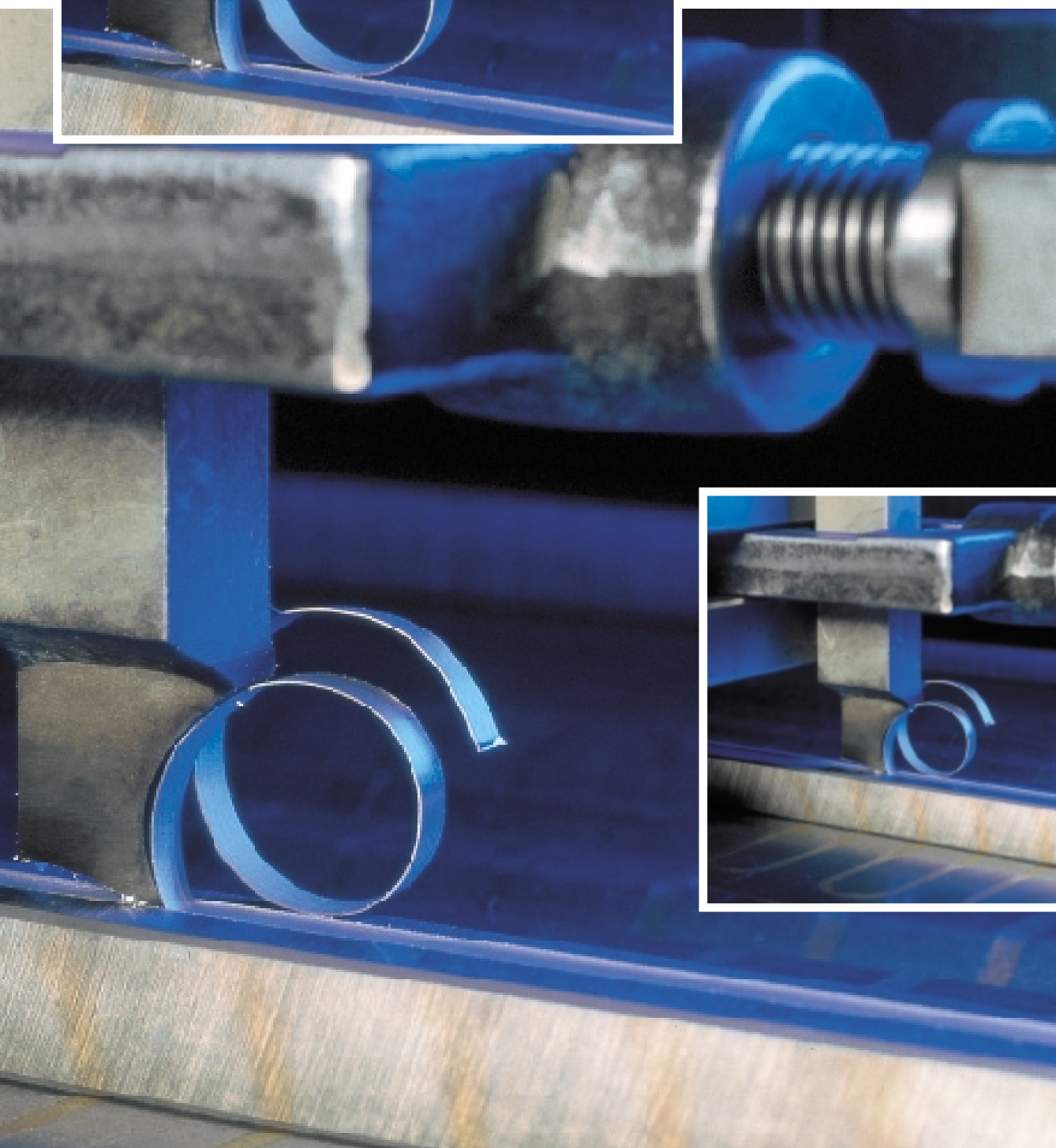
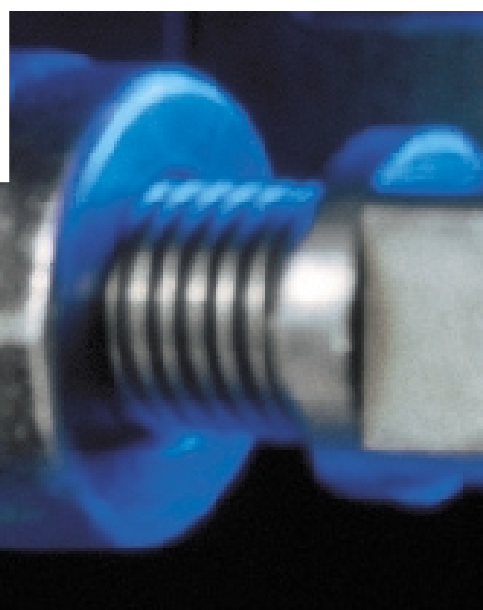
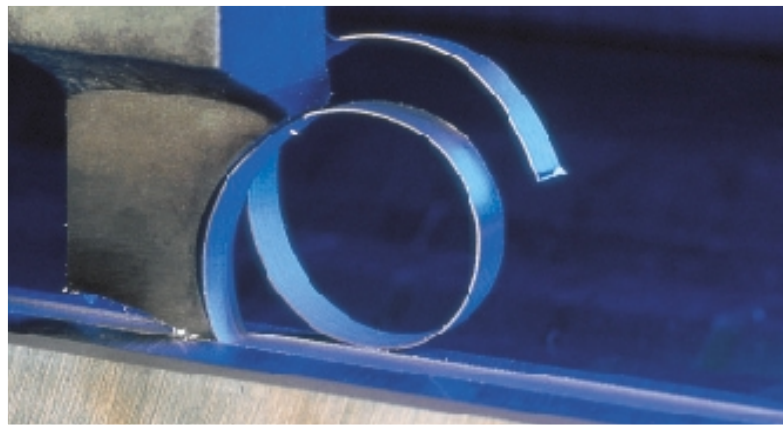
Software AG provides tailor-made support to help your development teams exploit the full potential of Natural.

Take advantage of our broad experience and refined skills. In a very short period of time, your IT team will be empowered to independently develop highly sophisticated applications. Our experts can assist them with issues of methodology, project management and quality control. Enhance your productivity through practical training programs tailored to your needs. In addition, our quarterly publication, Inside Natural, offers you a wealth of helpful hints – from developers, for developers.

### PROFESSIONAL SERVICES

Software AG's Professional Services offer a wide range of options to meet every need. Our highly skilled, highly experienced specialists can help you with analysis, technology strategy, systems design, applications design, programming, training, developer support, project management and project execution. This enables you to complete your project in the shortest possible time. In addition, you can out-source entire development projects or all your applications to Software AG. There is no project, large or small, we cannot help you with. Just come to us with your requirements.





## Further information

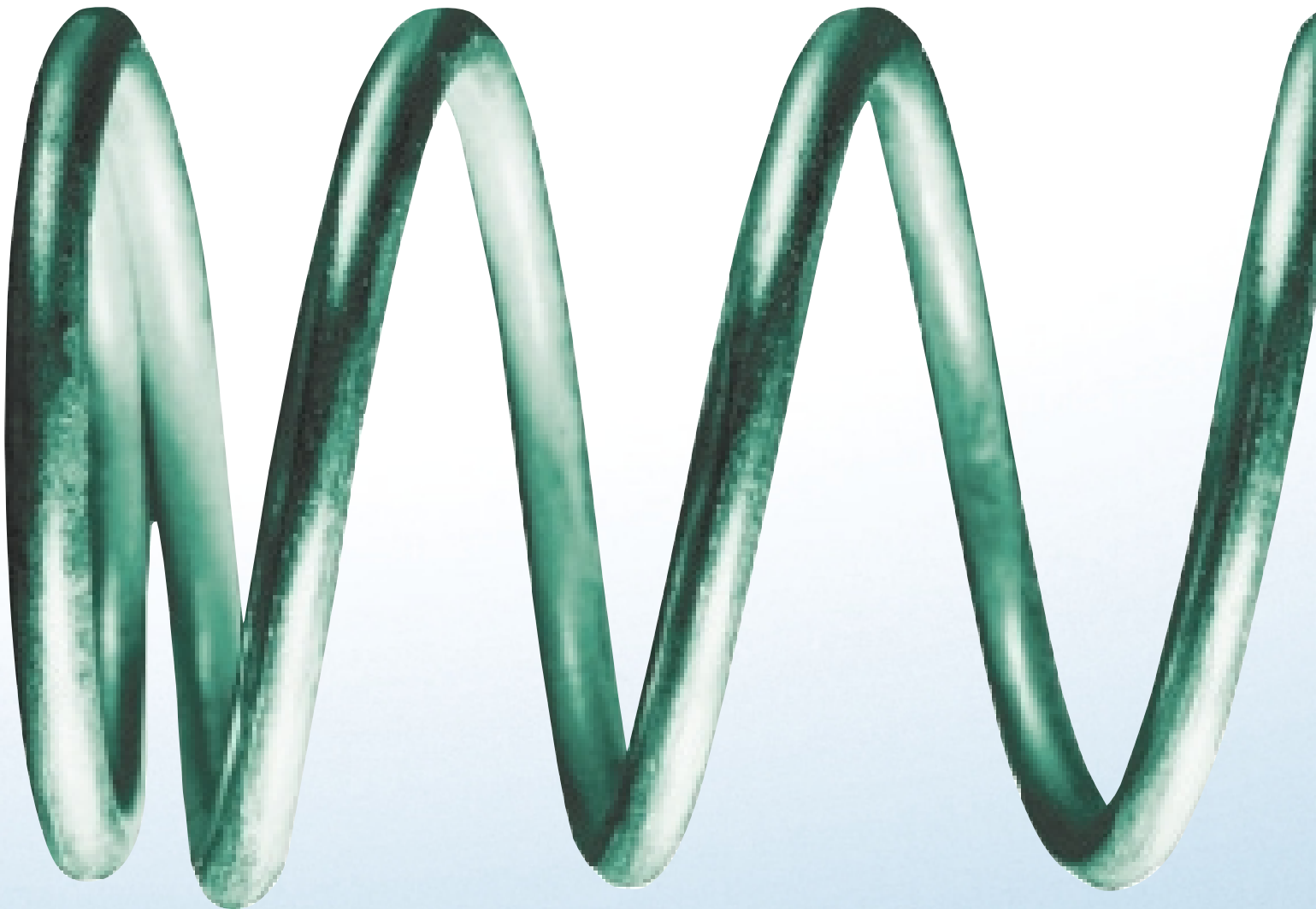
Fascinated by the possibilities?  
Ask for further information today.

### NATURAL HIGHLIGHTS

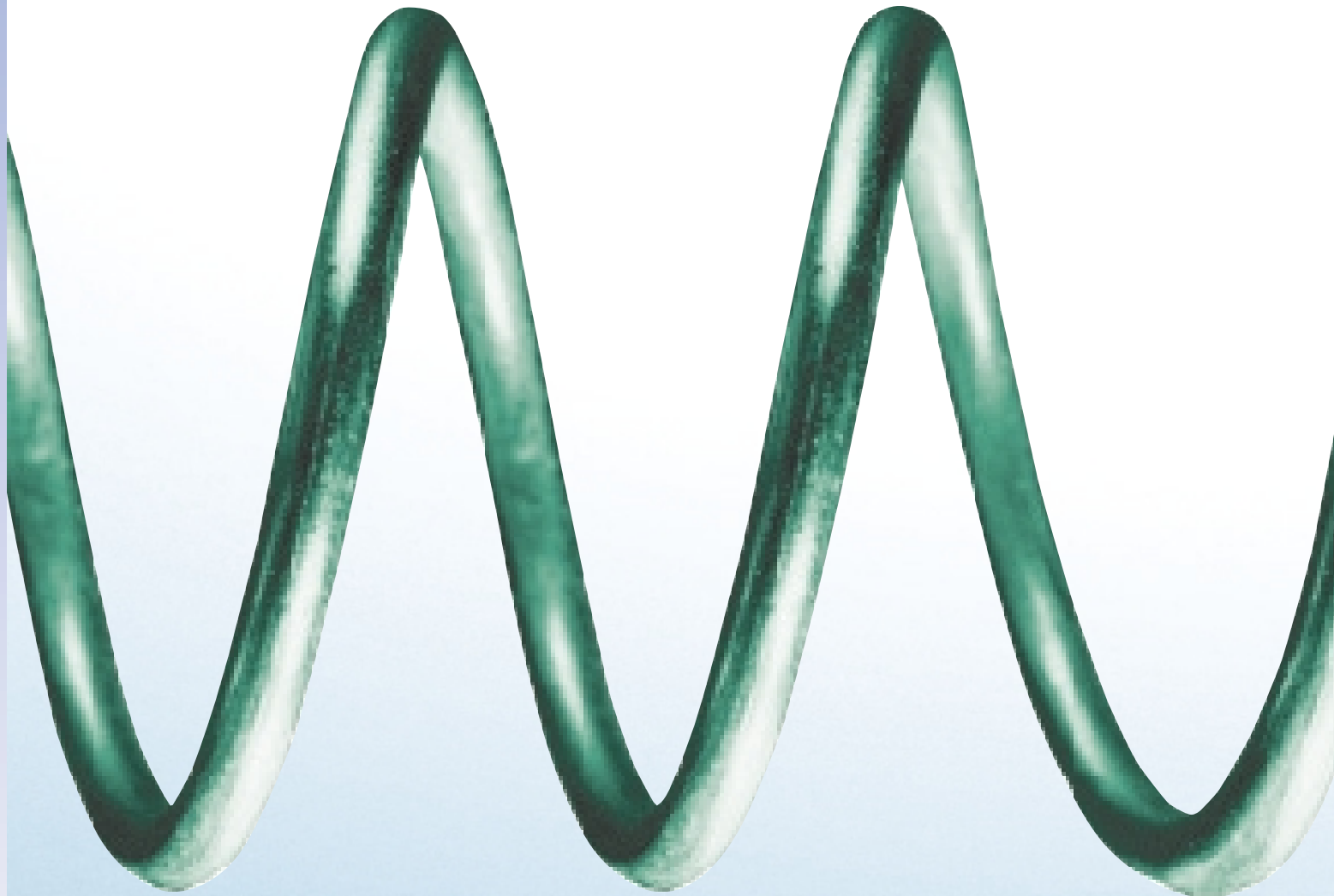
- ☒ Ultra-fast application development thanks to RAD
- ☒ Quick and easy to learn
- ☒ User-friendly graphical development environment
- ☒ Development of non-Windows applications with the Natural Studio on the Windows desktop (Natural's Single Point of Development architecture)
- ☒ Specifically designed for the development of business-critical applications
- ☒ Component-based development for maximum flexibility
- ☒ Protects investment in legacy applications
- ☒ Natural applications run on all leading platforms (mainframes, Unix, Windows, etc.)
- ☒ Natural applications work smoothly with all leading database systems (Adabas, Tamino, DB2, Oracle, etc.)
- ☒ Interoperability with programs in other languages such as C, Java, VisualBasic, COBOL
- ☒ Web support through HTTP client, XML Toolkit and XML Wrapper
- ☒ Automated documentation and quality control
- ☒ Protection of investment by Web-enabling existing Natural applications, and by converting legacy system functionality into reusable components
- ☒ Highly effective security concept
- ☒ Simple integration with leading ERP systems from SAP, Baan, etc.
- ☒ Batch-mode processing on all supported platforms – including Windows
- ☒ Integration of applications with the World Wide Web
- ☒ Exclusive developer support services



View all the latest information at  
[www.softwareag.com/Natural](http://www.softwareag.com/Natural)

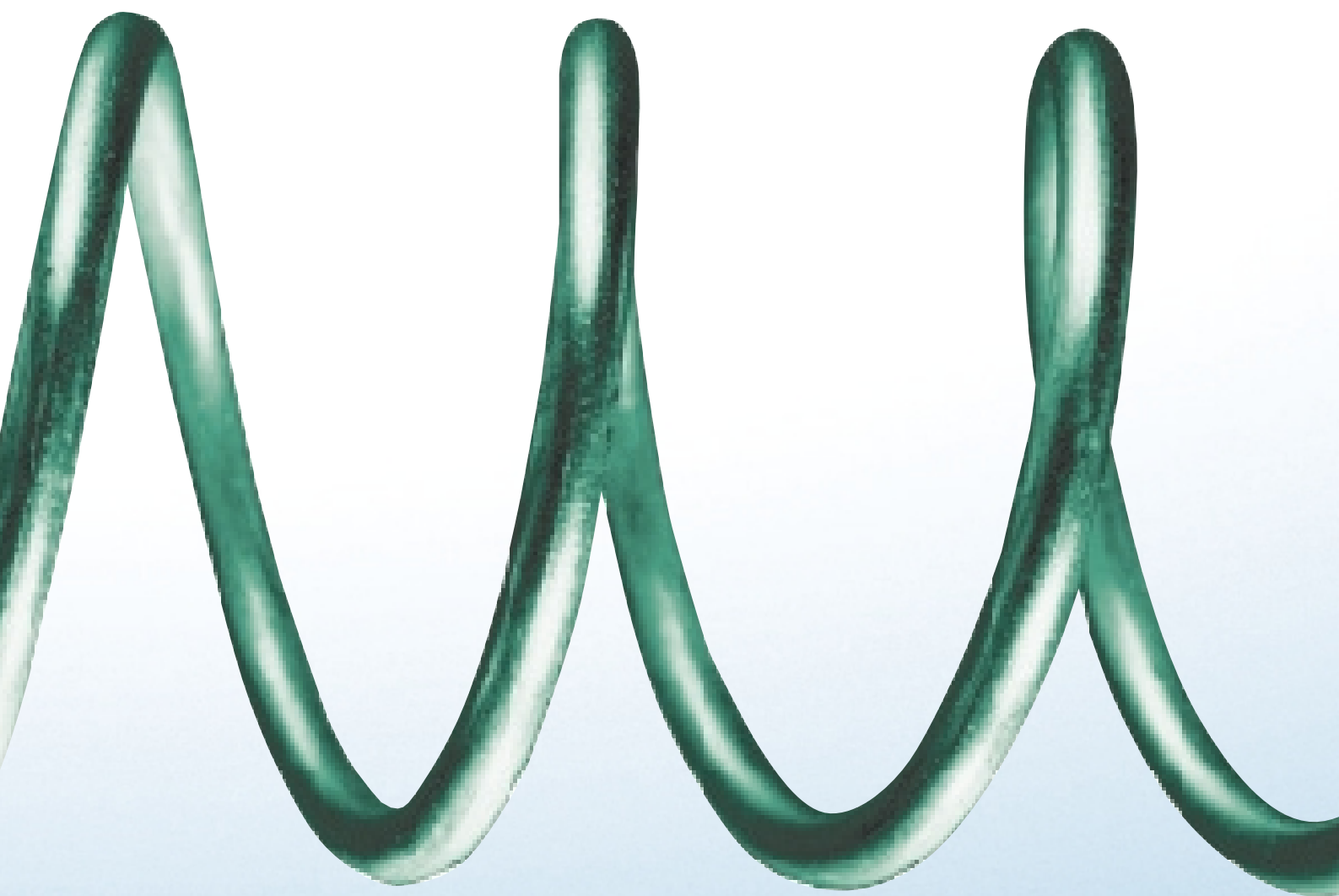


Pictures: BAVARIA page 11, Mauritius pages 1, 2/3, 4, 6/7, 14/15, Zefa page 19.





Software AG and/or all Software AG products are either trademarks or registered trademarks of Software AG.  
Other product and company names mentioned herein may be the trademarks of their respective owners.



**Software AG**  
**Corporate Headquarters**  
Uhlandstraße 12  
D-64297 Darmstadt  
Germany  
Tel.: +49-61 51-92-0  
Fax: +49-61 51-92-11 91  
[www.softwareag.com](http://www.softwareag.com)

NAT/5B05E0901 236

